DOE/RL-96-108
Rev. 0

Proposed Amendment to the September 1995 Record of Decision for the 100-BC-1, 100-DR-1, 100-HR-1 Operable Units

Date Published
December 1996

United States
Department of Energy
Richland, Washington

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DISCLM-5.CHP (8-91)

PROPOSED AMENDMENT TO THE SEPTEMBER 1995 RECORD OF DECISION FOR THE 100-BC-1, 100-DR-1, 100-HR-1 OPERABLE UNITS

Hanford Site, Richland, Washington

DOE, EPA, AND ECOLOGY ANNOUNCE PROPOSED RECORD OF DECISION AMENDMENT

The U.S. Environmental Protection Agency (EPA), the U.S. Department of Energy (DOE), and the Washington State Department of Ecology (Ecology) are proposing an amendment to the September 1995 Record of Decision (ROD) for the 100-BC-1, 100-DR-1, 100-HR-1 Operable Units at the Hanford Site. This proposed amendment would include 34 additional radioactive liquid waste disposal sites in the 100 Area for remediation, and updates the cost estimates for the remediation project.

PUBLIC PARTICIPATION ACTIVITIES

A public comment period will be held from December 16, 1996, to January 15, 1997. This proposed amendment has been discussed with the Hanford Advisory Board, Environmental Restoration Committee at meetings in July and August 1996. An additional public meeting will be held if a written request is received by Kevin Oates before January 6, 1997. After considering all comments, EPA may either issue the proposed amendment, issue an amendment modified by the public comments received, or retain the original selected remedy. The decision reached will be announced to the public and will include a responsiveness summary with responses to issues raised by the public. All submitted written comments will be placed in the Administrative Record for the 100 Area. Locations for the Administrative Record, which contains supporting documents and information about the sites, are listed on the last page of this announcement.

SUMMARY OF SITE HISTORY

The 100 Area lies at the north end of the Hanford Site in Benton County, Washington State, along the southern shoreline of the Columbia River as shown in Figure 1. The 100 Area National Priorities List (NPL) Site is composed of six noncontiguous reactor areas containing the nine retired plutonium production reactors and their ancillary facilities. Large amounts of cooling water flowed through the reactor cores and became contaminated with radionuclides and other waste. Soil and underlying groundwater were contaminated when cooling water, radioactive sludge, and other radioactive liquid waste was disposed in cribs and trenches or leaked from transfer systems.

A ROD was issued in September 1995 for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units to address actual or threatened releases at radioactive effluent disposal sites. The ROD identified 37 high-priority waste sites that had received liquid radioactive effluent discharges. The selected interim remedy for the 37 sites is to remove, treat as appropriate or required, and dispose of the waste. A cleanup contract for the first eight sites in the 100-BC-1 Operable Unit was awarded in June 1996. Full-scale cleanup and disposal at the onsite Environmental Restoration Disposal Facility (ERDF) began in July 1996.

EPA invites you to review this proposed amendment and to send any written comments by January 15, 1997 to:

Kevin Oates, Project Manager
U.S. Environmental Protection Agency
712 Swift Blvd, Suite 5
Richland, WA 99352

DESCRIPTION OF THE CHANGES

This ROD Amendment is being proposed for the following reasons:

- To expand the scope of the remedial action to include 34 additional sites within the 100 Area. These sites received similar discharges of radioactive liquid effluent as the original 37

high priority radioactive liquid waste disposal sites presented for remediation in the September 1995 ROD. The additional sites pose a similar level of risk to human health and the environment that also requires remediation. The additional sites are in the 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-KR-1, and 100-KR-2 Operable Units. The estimated cost of remediation and disposal of the 34 additional sites at the ERDF is approximately $112 million. Table 3 at the end of this document provides a brief description of the additional sites.

- Cost evaluations during remedial design for the original 37 sites identified significant opportunities for streamlining and coordination of remediation activities. Those evaluations, together with lessons learned from demonstration projects and an expedited response action, resulted in reductions to cost estimates for remediation of 100 Area waste sites. The most significant areas identified for cost savings included reduction in contaminated soil volume estimates and reduction in sampling and analysis costs. In addition, treatment prior to disposal is no longer being considered for volume reduction, and it has also been determined that contingency add-ons should be excluded. Therefore, these costs have been dropped from the cost estimates. The actual costs for remediation and waste disposal at the ERDF are lower than initially estimated due to competitive bidding among commercial firms. Preliminary cost estimates for the original 37 sites in the September 1995 ROD totaled $491 million. The current cost estimate for remediation and waste disposal for the same 37 waste sites, taking into account all of these factors, is approximately $82 million.

In addition, this proposed amendment will document the status of treatment for volume reduction and revegetation efforts at 100 Area liquid waste disposal sites. Summaries for both activities are discussed in the next section.

Tables 1 and 2 present a summary of the scope and cost changes from the 1995 ROD and this proposed amendment.

Table 1. Cost Estimates from the September 1995 ROD

Number of Sites	Volume for Disposal	Cost of Site Remediation	Cost of Disposal	Total
37	1,685,000 LCY*	$361M	$130M	$491M

** Loose Cubic Yards*

Table 2. Proposed ROD Amendment Cost Estimates

Number of Sites	Volume for Disposal	Cost of Site Remediation	Cost of Disposal	Total
37-Initial	535,000 LCY *	$49M	$33M	$82M
34-Additional	668,000 LCY *	$71M	$41M	$112M
71-Total	1,203,000 LCY *	$120M	$74M	$194M

** Loose Cubic Yards*

CLEANUP APPROACH REMAINS UNCHANGED

The cleanup goals for the September 1995 ROD and this proposed amendment are to remediate liquid waste disposal sites to levels that will not preclude any future uses, to protect groundwater in the 100 Area, and to protect the Columbia River. Some restrictions to groundwater use are expected to continue during and after cleanup activities.

The September 1995 ROD relies on the selection of the same remedy at multiple similar sites within the 100 Area. This is called the "Plug-in Approach." The approach combines historical information on former process operations with limited investigations on the nature and extent of contamination to determine which sites have similar types and patterns of contamination. Experience gained during the cleanup of similar sites within the 100 Area is used to plan and undertake the cleanup of additional sites without expending resources to further characterize these sites.

A summary of the key points of the selected remedy in the ROD is presented below.

- *"Remove contaminated soil, structures and debris from 100 Area source waste sites using the Observational Approach."* The Observational Approach uses field screening for contaminants during remediation to guide the extent of excavation. Remediation proceeds until it can be demonstrated through a combination of field screening and confirmatory sampling that cleanup goals have been achieved.

- *"Treatment, by thermal desorption to remove organics and/or soil washing for volume reduction, or as needed to meet waste disposal criteria."* At the completion of treatability studies during remedial design, it was found that treatment for volume reduction will not be cost effective for radioactive liquid waste disposal sites. Therefore, treatment will only be implemented to meet waste disposal criteria.

- *"Disposal of contaminated materials at ERDF."* The ERDF began receiving wastes in July 1996. The inclusion of additional waste sites for remedial action is consistent with the goals for disposal at the ERDF, and will allow for better planning of the transportation and disposal activities at the ERDF in future years.

- *"Backfill of excavated areas followed by revegetation."* Revegetation is not required as part of the remedy for protection of human health and the environment. Revegetation will help stabilize the surface of excavated areas to reduce windblown dust and will help re-establish habitat. Revegetation activities in the 100 Area will be conducted in accordance with the 100 Area Mitigation Action Plan that has been developed by DOE in conjunction with natural resource trustees and other stakeholders.

COMPARISON OF ALTERNATIVES

EPA uses the following nine criteria for evaluating cleanup alternatives and, when modifications of the remedy are proposed, compares the proposal against the original decision using the same nine criteria. The evaluation criteria fall into three categories: Threshold, Balancing, and Modifying. A brief description of the criteria and how they are used is presented below.

Threshold

1. Overall Protection of Human Health and the Environment - How well does the alternative protect human health and the environment, both during and after construction?

2. Compliance with Federal or State Environmental Standards (ARARs) - Does the alternative meet all applicable or relevant and appropriate state and federal laws?

Balancing

3. Long-Term Effectiveness and Permanence - How well does the alternative protect human health and the environment after completion of the cleanup? What, if any, risks will remain at the site?

4. Reduction of Toxicity, Mobility, and Volume Through Treatment - Does the alternative effectively treat the contamination to significantly reduce the toxicity, mobility, and volume of the hazardous substance?

5. Short-Term Effectiveness - Are there potential adverse effects to either human health or the environment during construction or implementation of the alternative? How fast are cleanup goals reached if the alternative is implemented?

6. Implementability - Is the alternative both technically and administratively feasible? Has the technology been used successfully on other similar sites?

7. Cost - What are the estimated costs of implementing the alternative?

Modifying

8. State Acceptance - What are the State's comments or concerns about the alternatives considered and about EPA's preferred alternative? Does the State support or oppose the preferred alterative?

9. Community Acceptance - What are the community's comments or concerns about the preferred alternative? Does the community generally support or oppose the preferred alternative?

COMPARISON OF THE ROD SELECTED REMEDY TO THE PROPOSED AMENDMENT

The following discussions compare how the evaluation criteria for the changes to the ROD compare to the original decision. It is important to note that the additional sites being proposed for cleanup are very similar to the sites selected in the original ROD. These types of waste sites have been evaluated in a feasibility study report that supports the cleanup actions. Another key point is that the evaluations that support the initial cleanup decision still hold and do not change.

1. Overall Protection of Human Health and the Environment

Both the existing ROD and the proposed amendment meet the threshold criterion of protection of human health and the environment. The approach to remediation of contaminated sites, as well as the cleanup goals, are the same for both. A key provision for the protection of human health is the proposed radionuclide standard for residential soils of 15 mrem/year above background.

2. Compliance with Federal or State Environmental Standards (ARARs)

The existing ROD and the proposed amendment will both comply with ARARs. The key ARARs are the Model Toxics Control Act for metals and organics in soils, Safe Drinking Water Act Maximum Contaminant Levels for groundwater, and Clean Water Act criteria for the Columbia River.

3. Long-Term Effectiveness and Permanence

The existing ROD and the proposed amendment have the same approach to remediation of the waste sites and the same remediation goals. Therefore, both will result in permanent protection of human health and the environment after cleanup goals are met. The remediation of 34 additional sites will increase the overall long-term effectiveness of the remedy in the 100 Area.

4. Reduction of Toxicity, Mobility, and Volume Through Treatment

The existing ROD and the proposed amendment have the same approach to remediation of the waste sites and the same remediation goals. Soil reduction treatment studies have shown that volume reduction is not cost effective for the radioactive liquid waste disposal sites. However, treatment to meet Land Disposal Restrictions may be required at some sites.

5. Short-Term Effectiveness

The existing ROD and the proposed amendment have the same approach to remediation of the waste sites. Both are similar with respect to meeting this criterion. However, the proposed amendment will add additional sites for remediation, which will increase the overall amount of time for completion of the remediation.

6. Implementability

The existing ROD and the proposed amendment have the same approach to remediation of the waste sites. Therefore, both are essentially the same with respect to meeting this criterion. The addition of 34 more sites will allow for better long-term planning of construction, transportation, and disposal activities.

7. Cost

The September 1995 ROD estimated cost of remediation of the original 37 sites was $491 million. The updated estimate for those 37 sites is $82 million. The proposed amendment would also add 34 more sites at an estimated cost of $112 million. The proposed amendment represents an 83% reduction in the estimated cost for the original 37 sites, and a 60% total reduction from the September 1995 ROD. The EPA, DOE, and Ecology will continue to work toward further streamlining activities in order to focus resources on cleanup.

8. State Acceptance

The State of Washington has concurred with this proposed amendment. The State will formally issue its position regarding acceptance of the amendment after public comments have been received and considered.

9. Community Acceptance

Community acceptance will be determined after evaluating comments received during the public comment period for this proposed ROD amendment.

STATUTORY DETERMINATION

The modified remedy would satisfy the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121. EPA and the State of Washington, Department of Ecology, believe that the modified remedy would remain protective of human health and the environment, comply with applicable or relevant and appropriate federal and state requirements, and be cost-effective. The remedy utilizes treatment and resource recovery technologies to the maximum extent practicable at this site.

Waste sites in the 100-DR-2 Operable Unit are included in this proposed action. Wastes from remediation of this Resource Conservation and Recovery Act (RCRA) Past Practice unit can be disposed of at the ERDF according to the provisions made in the August 1, 1996, Explanation of Significant Differences for the January 20, 1995, ERDF ROD. No redesignation of the regulatory pathway from RCRA Past Practice to CERCLA Past Practice is required prior to disposal of wastes from this operable unit at ERDF, or for other RCRA Past Practice operable units in future CERCLA decision documents.

POINTS OF CONTACT

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ADMINISTRATIVE RECORD

The Administrative Record, containing project documents, can be reviewed at the following location:

U.S. Department of Energy - Richland Operations
Administrative Record
2440 Stevens Center Place; Room 1101
Richland, Washington 99352
509/376-2530

INFORMATION REPOSITORIES

Limited documentation is available for review at the following repositories:

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U.S. Department of Energy Richland Public Reading Room
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Figure 1. Hanford Site Showing the Reactor Areas in the 100 Area and the ERDF

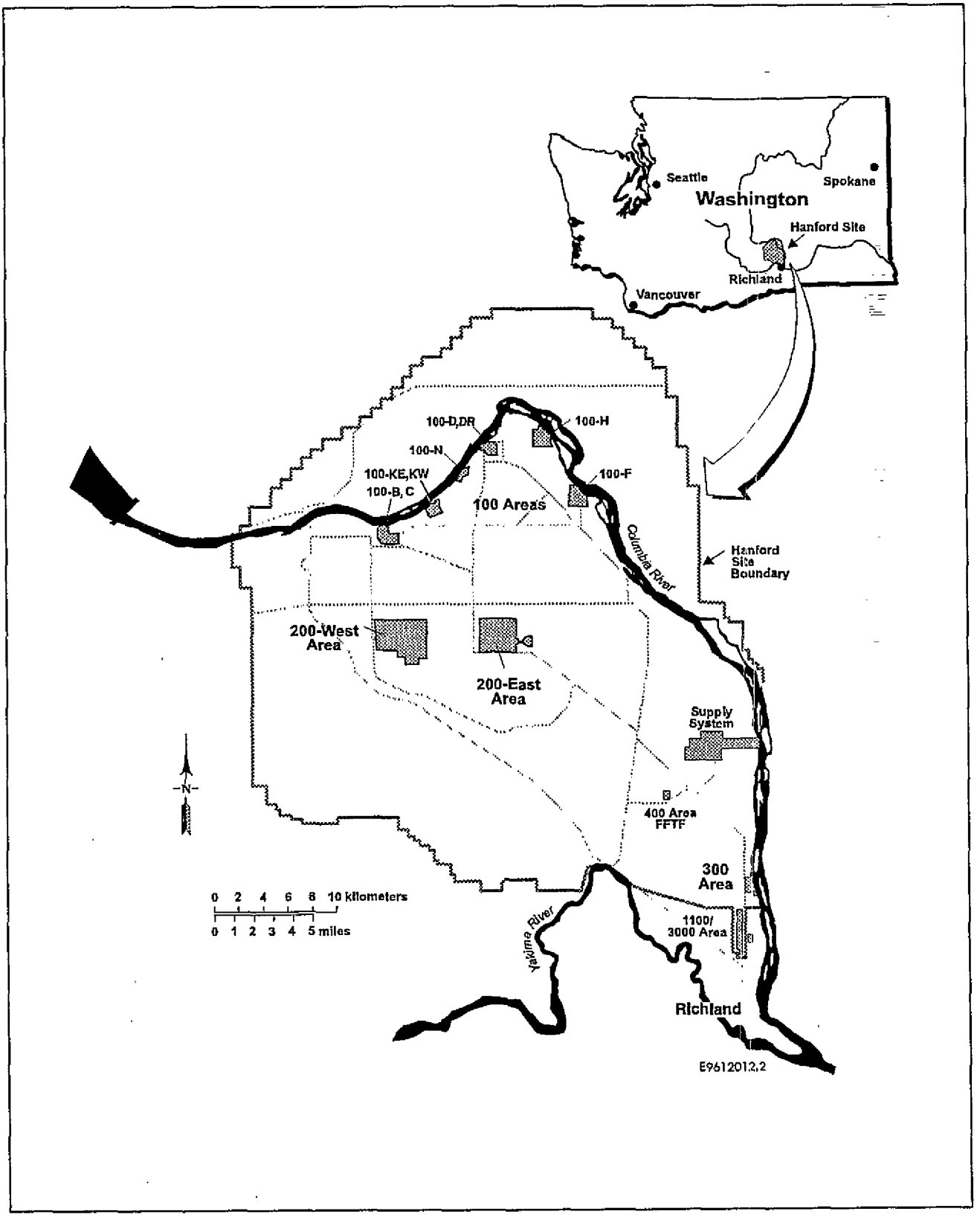

Table 3. Thirty-Four Additional 100 Area Radioactive Liquid Waste Sites

Operable Unit	Site Name	Wastes Received	Analogous Sites *
100-BC-2	116-C-2A Pluto Crib	Radioactively contaminated effluent from 116-C-2C Pluto Crib Sand Filter.	116-B-3 Pluto Crib
	116-C-2B/C Pluto Crib Pump Station/Sand Filter	Process effluent from C Reactor contaminated during fuel element cladding failures.	116-B-3 Pluto Crib
100-DR-1	116-D-3 French Drain	Radioactive and hazardous liquid wastes from 108-D Maintenance Shop and Cask Decontamination Pad.	116-B-4 French Drain
100-DR-2	116-DR-3 Storage Basin Trench	Radioactive sludge and water from the 105-DR Fuel Storage Basin.	116-D-1A Fuel Storage Basin Trench
	116-DR-4 Pluto Crib	Process effluent from DR Reactor contaminated during fuel element cladding failures.	116-D-2A Pluto Crib
	116-DR-6 Liquid Disposal Trench	Process effluent from DR Reactor released during effluent system maintenance and process upgrades.	116-DR-1 Process Effluent Disposal Trench
100-FR-1	UPR-100-F-2 Basin Leak Ditch	Unplanned release: process effluent overflow from retention basin and leaks from effluent pipeline.	116-B-1 Process Effluent Disposal Trench
	100-F-19 Process Effluent Pipelines	Process effluent from the F Reactor to the retention basins and outfall structures.	100-BC Process Effluent Pipelines
	108-F French Drain	Condensate from 108-F Biology Laboratory hoods.	116-B-4 French Drain
	116-F-1 Process Effluent Disposal Trench	Process effluent from F Reactor, 190-F Building, and 116-F-14 Retention Basin. Decontamination wastes from the 189-F Building.	116-B-1 Process Effluent Disposal Trench
	116-F-2 Process Effluent Disposal Trench	Process effluent from F Reactor, 190-F Building, and 116-F-14 Retention Basin. Decontamination wastes from the 189-F Building.	116-B-1 Process Effluent Disposal Trench
	116-F-3 Fuel Storage Basin Trench	Process effluent and sludge from the F Reactor fuel storage basin.	116-B-2 Fuel Storage Basin Trench
	116-F-4 Pluto Crib	Site was excavated as part of a treatability study in 1993.	116-B-3 Pluto Crib
	116-F-5 Ball Washer Crib	Wastes from decontamination of F Reactor equipment.	116-B-3 Pluto Crib
	116-F-6 Liquid Waste Disposal Trench	Process effluent diverted during maintenance shutdowns of F Reactor.	116-B-1 Process Effluent Disposal Trench
	116-F-9 PNL Animal Waste Leach Trench	Radioactively contaminated wash and waste water from animal pens.	116-B-1 Process Effluent Disposal Trench
	116-F-10 French Drain	Water and nitric acid from decontamination of F Reactor fuel element spacers.	116-B-4 French Drain
	116-F-11 Cushion Corridor French Drain	Radioactive liquids from decontamination of F Reactor equipment.	116-B-4 French Drain
	116-F-14 Retention Basins	Process effluent from F Reactor.	116-B-11 Retention Basin
100-FR-2	126-F-1 Powerhouse Ash Pit	Coal ash and soil radioactively contaminated by leakage from the F Reactor process effluent line.	116-B-1 Process Effluent Disposal Trench

Table 3. Thirty-Four Additional 100 Area Radioactive Liquid Waste Sites

Operable Unit	Site Name	Wastes Received	Analogous Sites [a]
100-HR-1	100-H-5 Sludge Burial Trench	Sludge from the 116-H-7 Retention Basins.	116-B-13 Sludge Trench
	100-H-17 Overflow	Two acres flooded by H Reactor process effluent from 1608-H Liquid Waste Disposal Trench.	116-B-1 Process Effluent Disposal Trench
	116-H-3 French Drain	Radioactively contaminated water and nitric acid from decontamination of H Reactor equipment.	116-B-4 French Drain
100-KR-1	100-KR-1 Process Effluent Pipelines	Process effluent from KE and KW Reactors to the retention basins, trenches, and outfall structures.	100-BC Process Effluent Pipelines
	116-K-1 Crib	Process effluent from KE and KW Reactors.	116-B-1 Process Effluent Disposal Trench
	116-K-2 Process Effluent Trench	Process effluent from KE and KW Reactors.	116-B-1 Process Effluent Disposal Trench
	116-KE-3 Retention Basin	Process effluent from KE Reactors.	116-B-11 Retention Basin
	116-KW-3 Retention Basin	Process effluent from KW Reactors.	116-B-11 Retention Basin
100-KR-2	100-K-1 French Drain	Radioactive effluent from 119-KW Sample Building.	116-B-4 French Drain
	116-KE-1 Condensate Crib	Condensate from KE Reactor gas purification system.	116-B-3 Pluto Crib
	116-KW-1 Condensate Crib	Condensate from KW Reactor gas purification system.	116-B-3 Pluto Crib
	116-KE-2 Waste Crib	Liquid waste from KE Reactor effluent test loop.	116-B-3 Pluto Crib
	116-KE-3 Fuel Storage Basin French Drain	Overflow from KE Reactor fuel storage basin.	116-B-4 French Drain
	116-KW-2 Fuel Storage Basin French Drain	Overflow from KW Reactor fuel storage basin.	116-B-4 French Drain

[a] Also see Table 6 of the September 1995 ROD for a more complete description of analogous sites in the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units.

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